

2.4.2.3 Task 3: Concepts and Designs that Address Regular Vertical Profiling of Aerosols.

In this task we will produce concepts and designs that address the issues of marrying smaller aircraft with smaller, lighter, lower-power, automated instruments. Possible directions under consideration include miniaturized instruments with the capabilities of AATS-14, as well as instruments with increased capabilities. The miniaturization effort will explore the use of an optical fiber with direct solar beam optics (e.g. offered by Metcon Inc., Boulder) aimed at significantly reducing the size of the instrument and the size of the port required for its installation. Reducing instrument size and weight will yield easier, more cost-efficient integration of the instrument onto smaller aircraft. The effort to enhance the instrument's capabilities will investigate the ability to perform airborne sky radiance measurements to derive aerosol size distribution and absorption much like the retrieval of those parameters from ground-based AERONET sun/sky-radiometers (Holben et al., 1998). In addition, we intend to study the feasibility of performing spectrally continuous direct solar beam measurements by means of a spectrometer (rather than using optical filters at discrete wavelengths as done currently with AATS-14). This task will benefit not only from our previous experience on a wide variety of aircraft (from Cessna Pelican to DC-8), but also our experience in NENA, especially if we do Option B (AATS-14 measurements on a smaller aircraft).